



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,175	08/21/2001	Robert L. Canella	4323US (MUEI-0543.00/US)	7405
7590	03/23/2004			EXAMINER KIELIN, ERIK J
Joseph A. Walkowski TRASKBRITT, PC P.O. BOX 2550 Salt Lake City, UT 84110			ART UNIT 2813	PAPER NUMBER

DATE MAILED: 03/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/934,175	CANELLA, ROBERT L.	
	Examiner	Art Unit	
	Erik Kielin	2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
 THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 08 December 2003.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 9-18, 20-23 and 42-45 is/are pending in the application.
 4a) Of the above claim(s) 42-45 is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 9-18 and 20-23 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8 December 2003 has been entered.

Claim Objections

2. Claim 9 is objected to because of the following informalities:
in line 9, replace “longitudinal” with --longitudinally-- for correct grammar. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 9-18 and 20-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claim 9 is considered indefinite because the phrase regarding the second end of the retaining portion having “a smaller lateral extent than the seat portion” is unclear. In

concert with the drawings, it is assumed that the phrase means that the retaining portion is of smaller diameter or cross-section than the seat portion.

The remaining claims are rejected for depending from the above rejected claims.

Claim Rejections - 35 USC § 102/103

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9, 11, 12, 14-16, 18, and 20-22 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,229,320 B1 (Haseyama et al., **Haseyama-1**, hereafter).

Regarding claim 9, **Haseyama-1** discloses a device for establishing electrical contact between a lead element **28** (called “solder bumps” col. 10, Fig. 15) extending from an integrated circuit **25** (called “IC” col. 10, line 31) comprising,

a one-piece substrate **31** (Fig. 7), **31A** (Fig. 14B), **31A, 41, 42** (Figs. 15-16) bounded by a first surface and an opposing, second surface and having at least one conductive trace **48** (Fig. 16), wherein said first surface is configured for mounting a plurality of IC devices (called “semiconductor devices” in Haseyama at col. 1, lines 18-27) thereto, and wherein the conductive trace 48 is configured for operably connecting said IC device **25** to at least one electrical component (e.g. **47**, Fig. 16) mounted on said one-piece substrate;

a spring contact (Figs. 21A-21B, 23A) including a base portion **71, 72, 73** (Figs. 24A-24C) and a contact portion **63**, said contact portion **63** comprising a resiliently compressible coil spring **63** comprising a plurality of coils (Fig. 22B, for example) configured to bias against and electrically contact a lead element **28** of an IC device **25** of said plurality of IC devices, and said base portion extending generally longitudinally from said contact portion and transversely to the coils of the coil spring (col. 15, lines 32-53; col. 16, lines 17-25); and

an aperture **43, 44** including

a seat portion **53A** (Fig. 14B called a “bump positioning part” col. 11, last paragraph or “positioning holes” col. 12, line 15) opening onto said first surface of said one-piece substrate **31A, 41, 42** and sized and configured to at least partially contain said contact portion **63** of said spring contact **63** and support the coils of the coil spring during compression thereof (Figs. 9, 13B, 14B); and

a retaining portion **46, 70** (Figs. 16, 24A-24C) having a first end connected to an opposing end of said seat portion **53A** (Fig. 14B) and a second end **46, 70** of a smaller lateral extent than the seat portion and extending a depth into said one-piece substrate **31A, 41, 42** therefrom, and configured to receive and electrically connect (by item **46** in

Fig. 16, called “through hole electrodes,” at col. 12, lines 45-47; or item **70** in Figs. 24A-24C) the base portion **71, 72, 73** of the spring contact **63**, to said at least one conductive trace **48** (Fig. 16).

Note that the compressed coil springs are supported by the seat portion (“bump positioning part”) of the aperture because the contact pins of **Haseyama** are shown as that in Figs. 21A through 22B and fit into the openings shown in Figs. 9, 13B, and 14B.

If it is thought that **Haseyama-1** does not provide a “one-piece substrate” since the items **31A, 41** and **42** are labeled differently, then this may be a difference. However, it has been held that the use of a one-piece construction instead of the separate pieces, would be merely a matter of obvious engineering choice. See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”) In the instant case, it would be obvious to form the **Haseyama-1** substrate **31A, 41, 42** integrally, because the parts of the substrate are shown in direct contact with each other in, for example, the **Haseyama-1** Fig. 9. Moreover, Fig. 14B shows that the seat portion and retaining portion of the aperture are integrally formed. Fig. 15 shows that the items **31A, 41**, and **42** form a “one-piece substrate.”

Regarding claims 11 and 15, a layer of conductive material **46** (Fig. 16), **70** (Figs. 24A-24C) or a volume of conductive filler **30** (Fig. 11; col. 10, lines 64-67), **70** (Figs. 24A-24C) is

disposed on the interior wall of the aperture **44, 70** and is therefore necessarily “in” the aperture and electrically connects the base portion **71, 72, 73** of the spring contact **63** to said conductive trace **48** (Fig. 16). Further regarding claim 15, it is noted that the claim does not limit from where the depth begins and ends. As shown in **Hasegawa** --as in Applicant’s Fig. 6, for example-- the depth is from the wall of the aperture inward.

Regarding claims 12, 14, 16, and 18, the conductive filler material **46, 70** is electrically connected to conductive traces **48** (Fig. 16) formed on said one surface and the opposing surface of said substrate **42**. Further regarding claims 14 and 18, the retaining portion **46** of the aperture **44** may open onto the opposing surface **42** of the one-piece substrate (Fig. 16).

Regarding claim 20, the second end of said retaining portion **46, 70**, opens onto an opposing surface of said substrate **42, 32** as shown in Figs. 16, 24A-24C.

Regarding claim 21, the seat portion may be conically shaped (Fig. 11), hemispherically shaped (Fig. 9) or cylindrically shaped (Fig. 14B).

Regarding claim 22, the seat portion **38** (or **53A**) is configured to at least partially align said lead element **28** of said IC device **25**, as noted above.

8. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama-1** in view of Patent Application Publication US 2002/0075025 A1 (**Tanaka**).

The prior art of **Haseyama-1**, as explained above, discloses each of the claimed features except for indicating that the substrate has an “intermediate conductive plane,” which Examiner interprets to be exemplary shown in the instant Fig. 11, item **669**.

Tanaka, like **Haseyama-1**, teaches a semiconductor testing tool, and provides an “intermediate conductive plane,” (called “internal lead wires 8” in the Abstract), electrically connected to the conductive layer or conductive filler 7, which beneficially reduces the number of structural elements of the test tool.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to include “intermediate conductive plane,” as taught by **Tanaka**, in the substrate of **Haseyama-1** to beneficially reduce the number of structural elements, by providing embedded elements, as expressly taught by **Tanaka**.

9. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama-1** in view of JP 2000-123935 (**Kawaguchi**).

The prior art of **Haseyama-1**, as explained above, discloses each of the claimed features except for indicating that the coil spring has at least two coils for contacting the lead elements.

Kawaguchi teaches a similar integrated circuit test tool to **Haseyama-1** wherein coil springs **20** (Figs 1 and 2) are used to make electrical contact to the lead elements **11** (solder bumps or conductive balls) of an integrated circuit **10**, and states in pertinent part (in the machine language translation) “this invention aims at offer of the contact pin which does not start the defective continuity by the poor contact, and the socket using this contact pin, without generating damage, when … a conductive ball is contacted” (paragraph [0006]) and in solving the problem provides a contact pin having a contact section, “of the shape of a spiral by two or more number-of-turns sections of a coiled spring edge.”

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use two or more coil turns as taught by **Kawaguchi** in the spring contact portion of **Haseyama-1** to prevent damage and provide better contact with the solder bumps, as expressly taught by **Kawaguchi**.

10. Claims 9, 10, 13, and 15-17 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Patent Application Publication 2002/0060579 A1 (Haseyama et al.; **Haseyama-2**, hereafter) in view of Applicant's admitted prior art (**APA**).

Regarding claim 9, **Haseyama-2** discloses a device for establishing electrical contact between a lead element **31** extending from an integrated circuit **30** comprising, a one-piece substrate **20, 24** (Fig. 5A), bounded by a first surface and an opposing second surface and having at least one conductive trace **25** (Fig. 5B), wherein said first surface is configured for mounting a plurality of IC devices (called "semiconductor devices" in Haseyama at col. 1, lines 18-27) thereto, configured for operably connecting said IC device **30** to at least one electrical component **26** mounted on said one-piece substrate; a spring contact (Figs. 4A-4F) including a base portion **11A-11F** and a contact portion **12**, said contact portion comprising a resiliently compressible coil spring **12** comprising a plurality of coils configured to bias against and electrically contact a lead element **31** of an IC device **30** of said plurality of IC devices, and said base portion **11A-11F** extending generally longitudinally from said contact portion **12** and transversely to the coils of the coil spring **12**; and

an aperture **21** opening onto one surface of said one-piece substrate and extending a depth at least partially into said one-piece substrate (Figs. 5A-5B), said aperture **21** configured to receive and electrically contact said base portion of said spring contact,

wherein the aperture **21** includes

a seat portion (Fig. 5B) opening onto said first surface of said one-piece substrate **20, 24** and sized and configured to at least partially contain said contact portion **12** of said spring contact **12** and support the coils of the coil spring during compression thereof (Figs. 4A-4F); and

a retaining portion (Fig. 5B) having a first end connected to an opposing end of said seat portion and a second end of a smaller lateral extent than the seat portion (the second end is taken to be the bottom of the opening having zero lateral extent) and extending a depth into said one-piece substrate **20, 24** therefrom, and configured to receive and electrically connect (by item **46** in Fig. 16, called “through hole electrodes,” at col. 12, lines 45-47; or item **70** in Figs. 24A-24C) the base portion **71, 72, 73** of the spring contact **63**, to said at least one conductive trace **48** (Fig. 16).

If it is thought that **Haseyama-2** does not provide a “one-piece substrate” since the items **20, 24** are labeled differently and shown bolted together in Fig. 5A, then this may be a difference. However, it has been held that the use of a one-piece construction instead of the separate pieces, would be merely a matter of obvious engineering choice. See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art

Art Unit: 2813

comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, “that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.”) In the instant case, it would be obvious to form the **Haseyama-2** substrate integrally, because the items **20** and **24** of the substrate are shown bolted together in Fig. 5A to form a one-piece substrate.

Haseyama-2 does not teach that the first surface is configured to hold plural integrated circuit devices.

APA teaches in paragraph [0002],

“State of the Art: Integrated circuit (IC) devices, such as Ball Grid Array (BGA) packages and Small Outline J-Lead (SOJ) packages, are commonly assembled into multi-chip modules for connection to higher-level packaging, such as a motherboard or a personal computer chassis. **Generally, a multi-chip module (MCM) includes a carrier substrate, such as a printed circuit board, having a plurality of IC devices mounted thereto.** Other electrical components, such as resistors, capacitors, inductors, or other suitable devices, may also be mounted on the carrier substrate of the MCM, or even on the IC devices.” (Emphasis added.)

It would have been obvious for one of ordinary skill in the art, at the time of the invention to configure the first surface of **Haseyama-2** to attach plural IC devices in order to form a multi-chip module and also to test the multi-chip module, as taught to be known in **APA**. Moreover, the courts have held that mere duplication of parts has no patentable significance unless a new or unexpected result is produced see *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). No unexpected results from attaching more than one integrated circuit device. Instead the result is quite expected, that a multi-chip module can be formed. Alternatively, testing of plural integrated circuit devices simultaneously would desirably increase device throughput.

Regarding claim 10, **Haseyama-2** discloses the second end of said retaining portion does not extend through the one-piece substrate **20, 24** to said opposing, “substantially planar” second surface. The opening ends at the end of **20** but does not go through **24**. Note that **24** is called a “substrate” at paragraph [0037].

Regarding claim 15, **Haseyama-2** discloses item **25** in Fig. 5B, shown to be a volume of conductive filler material disposed in and filling at least a partial depth of said aperture **21**, and electrically contacting said base portion of said spring contact.

Regarding claim 16, **Haseyama-2** discloses the conductive filler **25** connects to the at least one conductive trace **26**.

Regarding claims 13 and 17, **Haseyama-2** discloses item **26**, a conductive trace formed at an intermediate plane in the one-piece substrate **20, 24**.

Response to Arguments

11. Applicant's arguments filed 8 December 2003 have been fully considered but they are not persuasive.

Applicant argues that Haseyama-1 does not teach all features. Examiner respectfully disagrees for reasons presented in the rejections above. Applicant's perceived deficiencies in Haseyama-1 are based upon a selective interpretation of the claim limitations. However, claim limitations will not be narrowed or broadened by incorporating limitations from the specification into the claims.

Applicant's arguments regarding Haseyama-2 have been considered but are moot in view of new grounds of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
18 March 2004